Acta Derm Venereol 2011; 91: 415–421

INVESTIGATIVE REPORT

A Case-control Study on Family Dysfunction in Patients with Alopecia Areata, Psoriasis and Atopic Dermatitis

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Family history can provide important information about a patient's psychological status, and thus their disease risk. A multicentric case-control study on family dysfunction was performed on 59 patients with psoriasis (63.7%), atopic dermatitis (11.9%) or alopecia areata (25.4%), and 47 patients with minor skin problems (controls), all attending a dermatological clinic or a psychodermatological consultation. The mean age of subjects was 47.7 years in the cases and 48.8 years in the controls. Women represented 53% of cases and 62% of controls. Patients and controls first completed the General Health Questionnaire (GHQ-12) and the Toronto Alexithymia Scale (TAS-20) questionnaire. The overall prevalence of anxiety and/or depression in cases was 43.3% (71.4% in atopic dermatitis). To collect the family history a genogram was built by the interviewer during a semi-structured interview. It can show dysfunction in the family, as it highlights alliances and ruptures, generational repetition of behaviours of dependence or vulnerability, and traumatic events. The mean (± standard deviation) genogram score was 6.7 ± 3.3 in the cases and 3.0 ± 2.4 in the controls ($p < 0.001$). The cases had three times the risk of having moderate family dysfunction compared with controls and 16 times the risk of having a severe family dysfunction. The genogram score was correlated with the severity of the disease as evaluated by the patient. In conclusion, family dysfunction may play an important role in the onset or the exacerbation of psoriasis, alopecia, and atopic dermatitis. ***Key words: dermatology; psychology; genogram; family dysfunction, psoriasis, atopic dermatitis, alopecia areata.***

(Accepted November 13, 2010.)

Acta Derm Venereol 2011; 91: 415–421.

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Collecting family history has been recognized as an important tool for the detection of disease risk (1). It has been shown to provide important information in cardiovascular diseases (2, 3), cancer (4), lipid disorders (5) and other complex and common diseases. Family history can also provide important information about psychological aspects and relationships.

Different approaches are available to collect family information. In general, a physician directly asks the patient several questions about his or her family. However, a systematic and standardized evaluation yields more accurate and relevant information. The genogram, a tool to represent the complexity of the family, was initially developed by Murray Bowen, an American psychiatrist, and one of the founders of the systemic family therapy (6). According to Bowen, individuals cannot be understood in isolation from one another, but rather as part of their family, since the family is an emotional unit.

To the best of our knowledge, the genogram has not been used in dermatological settings. The role of stressful life events in these conditions is controversial (7). However, there are studies showing a higher number of stressful events in the life of patients with psoriasis (8), alopecia areata (9) and atopic dermatitis (10) compared with people who do not have these diseases. The specific role of family dysfunction in these diseases has not been investigated previously.

It is well known that psychiatric disorders are frequent among patients with skin problems, much more than in the general population (11, 12), and that several conditions, such as alopecia areata, atopic dermatitis, and psoriasis, may have a high impact on patients' psychosocial life (13–15). Moreover, although the results are conflicting, preliminary data have shown an association between dermatological conditions and alexithymia (16, 17), i.e. difficulty in identifying and describing feelings.

The aim of the present case-control study was to investigate the possible relationship between family dysfunction, as evaluated using the genogram, and the presence of dermatological conditions with a strong psychosocial component, such as alopecia areata, atopic dermatitis and psoriasis. Moreover, family dysfunction was evaluated according to the severity of the disease, and the presence of anxiety and/or depression and alexithymia.

MATERIALS AND METHODS

Study design and study population

This is a multicentric case-control study performed in a dermatological setting. Data were collected between July 2007 and June 2009 in four clinical centres: the University Hospital Erasme, Brussels, Belgium; the Clinique Notre Dame de Grâce,

 doi: 10.2340/00015555-1074
 ISSN 0001-5555

Gosselies, Belgium; the Istituto Dermopatico dell'Immacolata IDI-IRCCS, Roma, Italy; and the University Hospital of Padova, Italy. The study was approved by the local ethics committee of each centre. The cases included patients with a diagnosis of either alopecia areata or atopic dermatitis, or psoriasis, attending the dermatological clinics of the participating centres, and, in one site (Erasme Hospital), a psychodermatological consultation. The control group included people admitted to the same centres for skin conditions usually considered as not influenced by psychological factors, such as naevi, cysts, seborrhoeic keratosis, and actinic keratosis. Inclusion criteria for both cases and controls were: age 18 years or more, ability to read, knowledge of the language, and absence of any severe mental condition.

On pre-defined days, all patients attending the dermatological clinics were contacted. Due to the long time (approximately an hour) necessary to perform the genogram, it was not possible to include all the patients in the study. The first patient who signed the informed consent was included in the study and administered the genogram, then the first available patient entered the study, and so on. In the psychodermatological setting much more time is usually available for each patient, so it was possible to include all consecutive patients with the skin conditions of interest.

Instruments

The self-administered 12-item General Health questionnaire (GHQ-12) and the Toronto Alexythimia Scale (TAS-20) were completed by the patient before the visit, and then returned to the dermatologist. After the visit, depending on the centre, either a psychologist, or a psychotherapist, or a dermatologist built the genogram with the patient.

12-item General Health Questionnaire (GHQ-12). The GHQ-12 is a self-administered questionnaire consisting of 12 items, designed to measure psychological distress and detect current non-psychotic psychiatric disorders (18), usually depressive or anxiety disorders. Answers are given on a 4-point scale. The GHQ-12 was scored with the binary method (0-0-1-1). In this way, each subject obtained a score from 0 to 12: patients scoring 4 or more were operationally defined "GHQ cases", i.e. as having possible psychiatric morbidity (19).

20-item Toronto Alexithymia Scale (TAS-20). The TAS-20 is a widely used self-reported questionnaire to detect alexithymia. The main manifestations of alexithymia are difficulty describing or recognizing one's own emotions, and general constriction in affective life. The TAS-20 gives three subscales scores measuring, respectively, difficulty in identifying feelings, difficulty in describing and communicating feelings, and tendency to focus on the concrete details of external events rather than on feelings, fantasies and other aspects of one's own inner experience ("externally oriented thinking").

29-item Genogram Scale. The genogram consists of a family tree, built by the interviewer during a semi-structured interview (20), including information on family structure, demographics, life events, family social problems and medical information. It can show dysfunction in the family as it highlights alliances and ruptures, generational repetitions of behaviours of dependence or vulnerability, and traumatic events.

In this study, information was collected on three generations, as usual (21). The first generation is the presenting couple, which is a dyad in which one partner is the patient or accompanies a child patient. Information concerns the presenting couple, their children, siblings, nieces, nephews, parents, aunts, uncles and grandparents. In the collection of data, standard pedigree symbols are used to facilitate visual interpretation of the data.

The 29-item Genogram Scale (Appendix I) was created by Greenwald et al. (22), and has been shown to correlate with measured family dysfunction. The 29 items concern traumatic events that have occurred in the nuclear family and in the family of origin. Each item with a positive occurrence is assigned one point, with the exception of two items, which are assigned two points (i.e. incest and non-recovering chemical dependency in the nuclear family). The sum of the scores gives the genogram score: the higher the score, the higher the family dysfunction.

Cut-points for family dysfunction have been established, i.e. 0–2 = none, 3–5 = moderate, and ≥ 6 = severe (22).

Clinical information

The dermatologists also collected information on personal data, clinical history and clinical data of the patients. The clinical severity of psoriasis was measured using the Psoriasis Area and Severity Score (PASI) (23), that of atopic dermatitis by the SCORAD (SCORing Atopic Dermatitis) (24), and the severity of alopecia was determined using the Alopecia Areata Investigation Assessment guidelines (25). In addition, both the dermatologist and the patient evaluated the severity of the disease on a five-point scale score (very mild, mild, moderate, severe and very severe).

Statistical analyses

Data concerning demographic variables and genogram scores were compared using *t*-test and analysis of variance (ANOVA) for continuous variables and χ^2 test for categorical variables. Median genogram scores were compared using the non-parametric Mann–Whitney test. Odds ratios (OR) and confidence intervals (CI) were calculated for the genogram score, the GHQ-12 and the TAS-20 status. Spearman's rho correlation coefficient was calculated to evaluate the correlation between variables. To evaluate the relationship between the genogram score and the presence of one of the dermatological conditions considered, taking into account other variables, a linear regression model was created. The genogram score was the dependent variable and the status of case, gender, age, GHQ-12 status, alexithymia and centre were used as independent variables.

Statistical analyses were performed using the software SPSS 13.0 for Windows.

RESULTS

Population

Complete information was collected in 106 patients, 59 cases and 47 controls. Among cases, 37 (62.7%) had psoriasis, 15 (25.4%) alopecia, and 7 (11.9%) atopic dermatitis. The mean (± standard deviation) age was 47.7 ± 16.4 years in cases and 48.8 ± 19.6 in controls, and women were 53% of cases and 62% of controls. The characteristics of the studied population are summarized in Table I. There was no statistically significant difference between cases and controls concerning gender, age, marital status and education. However, the prevalence of cases and controls was different in the four centres.

Genogram score

The mean genogram score was 6.7 ± 3.3 in cases and 3.0 ± 2.4 in controls. The difference was statistically significant ($p < 0.001$). The distribution of the genogram scores in each group is summarized using a box-plot

Table I. *Characteristics of the study population*

	Cases[a] *n* (%)	Controls[a] *n* (%)	*p*-value
Gender			
Men	27 (46.6)	18 (38.3)	
Women	31 (53.4)	29 (61.7)	0.44
Age (years)			
<30	8 (14.3)	10 (23.3)	
30–39.9	12 (21.4)	7 (16.3)	
40–49.9	14 (25.0)	8 (18.6)	
50–59.9	10 (17.9)	5 (11.6)	
≥60	12 (21.4)	13 (30.2)	0.52
Marital status			
Unmarried	9 (16.4)	16 (34.8)	
Married	29 (52.7)	22 (47.8)	
Divorced	11 (20.0)	4 (8.7)	
Widow/-er	6 (10.9)	4 (8.7)	0.12
Education			
Primary school	8 (15.4)	3 (6.5)	
Secondary school	15 (28.8)	7 (15.2)	
High school	21 (40.4)	20 (43.5)	
University	8 (15.4)	16 (34.8)	0.06
Centre			
Rome	9 (15.3)	22 (46.8)	
Erasme	23 (39.0)	10 (21.3)	
Gosselies	14 (23.7)	8 (17.0)	
Padova	13 (22.0)	7 (14.9)	<0.01

[a]Totals may vary because of missing figures.

(Fig. 1). The score was significantly different between each disease and the control group, as well as between patients with psoriasis and alopecia. In the three centres the mean genogram scores in cases and controls were, respectively, 3.2 and 1.6 ($p<0.01$) in Rome; 8.0 and 5.1 ($p<0.01$) in the Erasme centre; 7.4 and 4.0 ($p<0.01$) in the Gosselies centre; and 6.1 and 3.4 ($p=0.16$) in Padova. In cases, no differences in the genogram mean score were observed according to gender and age.

Seventeen per cent of controls had a genogram score of 6 or more, 54% of patients with psoriasis, 57% with atopic dermatitis and 93% with alopecia areata. The ORs for the genogram score, the GHQ-12 status and the presence of alexithymia, as measured using the TAS-20, are shown in Table II. The risk of having a genogram score from 3 to 5 was 3.2 in cases compared with controls, and 16.3 for a genogram score of 6 or more. Also the ORs for alexithymia and GHQ-12 were highly significant.

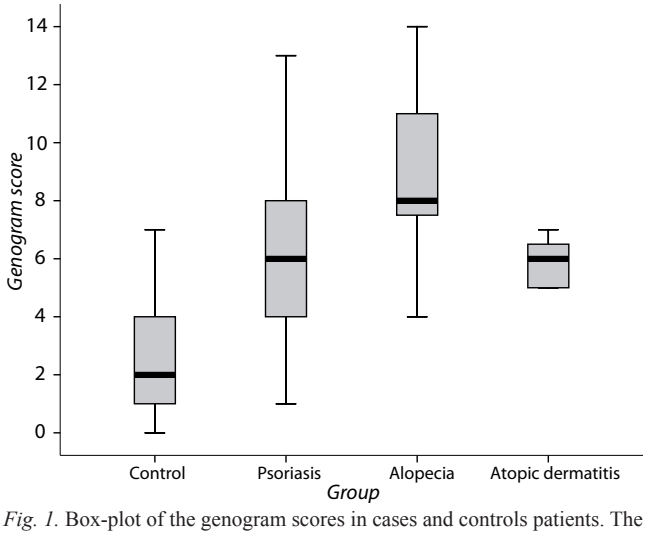

Fig. 1. Box-plot of the genogram scores in cases and controls patients. The thicker horizontal black line indicates the median value, and the bottom and top of the box correspond to the 25th and 75th percentile of the distribution.

A different prevalence was observed in several items of the genogram (Table III), such as affairs in the presenting couple, chronic unemployment, abuse, and chronic illness, always with a higher prevalence in cases compared with controls. In Fig. 2, the prevalence of some items of the genogram is presented for all diseases. The prevalence of several items was particularly high in patients with alopecia, such as "more than 2 cases of dependencies", and "abuse". In patients with atopic dermatitis there was a high prevalence of patients reporting, among other factors, "illness vulnerability", "bankruptcy or job termination" and "abortion in nuclear family".

Genogram and severity of the disease

In all cases, the genogram score correlated positively with the severity of the disease as evaluated by the patient (rho = 0.38, $p<0.01$). The correlation was not significant between the genogram score and the severity evaluation by the physician (rho = 0.21, $p=0.15$). The correlation between the genogram and the PASI score was not significant (rho = –0.27, $p=0.13$), while that with the SCORAD in patients with atopic dermatitis was highly significant (rho = 0.90, $p=0.01$) despite the very low number of cases.

Genogram and psychological problems

The prevalence of probable depression or anxiety was 43.3% in cases (39.5% in psoriasis, 40.0% in alopecia, and 71.4% in atopic dermatitis) and 19.1% in controls. Spearman's rho correlation between the continuous

Table II. *Odds ratios (OR) and confidence intervals (CI) for genogram scores, GHQ-12 status, and presence of alexithymia*

	Cases %	Controls %	OR (95% CI)
Genogram score			
0–2	22.6	77.4	Ref.
3–5	48.3	51.7	3.2 (1.1–9.7)
≥6	82.6	17.4	16.3 (5.2–50.7)
GHQ-12			
Non-case	46.5	53.5	Ref.
Case	74.3	25.7	3.3 (1.4–8.1)
Alexithymia			
No	39.3	60.7	Ref.
Probable	64.0	36.0	2.7 (1.0–7.3)
Yes	78.9	21.1	5.8 (1.7–19.8)

GHQ-12: 12-item General Health Questionnaire.

Table III. *Prevalence of cases and controls for each item of the genogram (Appendix I)*

Item	Cases (%)	Controls (%)	*p*-value
1. Incest NF	10.2	2.1	0.10
2. Chemical dependency NF	18.6	6.4	0.06
3. Emotions in interview	8.5	2.1	0.16
4. >2 chemical dependency	27.1	8.5	**0.01**
5. Incest not NF	5.1	0.0	0.17
6. Arrest NF	1.7	0.0	0.56
7. Affair PC	16.9	4.3	**0.04**
8.Unemployment	33.9	6.4	**<0.01**
9. Suicide attempts	18.6	8.5	0.11
10. Psychosis NF	5.1	0.0	0.17
11. Somatiform disorder	8.5	6.4	0.49
12. Unplanned pregnancies	16.9	6.4	0.09
13. Abuse NF FO	50.8	8.5	**<0.01**
14. Emotional illness NF	28.8	23.4	0.34
15. Adoption NF	6.8	6.4	0.63
16. >2 marriages PC	15.3	0.0	**<0.01**
17. Focus on children NF	11.9	0.0	**0.01**
18. Illness vulnerability	18.6	14.9	0.40
19. Geographic distribution	33.9	12.8	**0.01**
20. Chronic illness NF FO	67.8	31.9	**<0.01**
21. Deaths NF FO <60 years	79.7	72.3	0.26
22. Low education	27.1	6.4	**<0.01**
23. Emotional cut-off	30.5	12.8	**0.02**
24. Bankruptcy	8.5	8.5	0.63
25. Elective abortion NF	15.3	4.3	0.06
26. Divorce NF	33.9	21.3	0.11
27. Remarriage family members	18.6	14.9	0.40
28. Incarceration family members	15.3	2.1	**0.02**
29. Immigration PC	6.8	4.3	0.45

NF: nuclear family, FO: family of origin, PC: presenting couple. **Bold** refers to $p<0.5$.

GHQ score and the genogram score in cases was 0.30 ($p=0.02$).

The prevalence of patients with alexithymia or probable alexithymia was 66.7% in patients with psoriasis and with atopic dermatitis, 33.3% with alopecia and 27.7% in controls. The correlation between the TAS-20 score and the genogram score was significant only in patients with atopic dermatitis (rho = 0.63).

Concerning the GHQ-12, the genogram scores were significantly higher in cases than in non-cases in patients with psoriasis and with atopic dermatitis. No difference was observed for alopecia. The median genogram scores were not different among patients with and without alexithymia, except for atopic dermatitis.

Multivariate analysis

The association between the genogram score and the status of cases remained significant (unstandardized beta coefficient = 2.9, $p=0.01$), after taking into account gender, age, GHQ-12 status, alexithymia and centre. Also the variable "age" was significant in the model, being negatively correlated with the genogram score (beta = 0.04, $p=0.03$). The genogram score was also significantly associated with each of the diseases considered.

DISCUSSION

In this study, we observed a high level of family dysfunction in patients with psoriasis, alopecia areata, and atopic dermatitis. The cases had three times the risk of having moderate family dysfunction compared with controls and 16 times the risk of having severe family dysfunction. As far as we know, this is the first study that investigated family dysfunction in dermatological conditions using systematic collection of the patient's family history.

The dermatological conditions studied are known to have a psychological component. Psoriasis has often

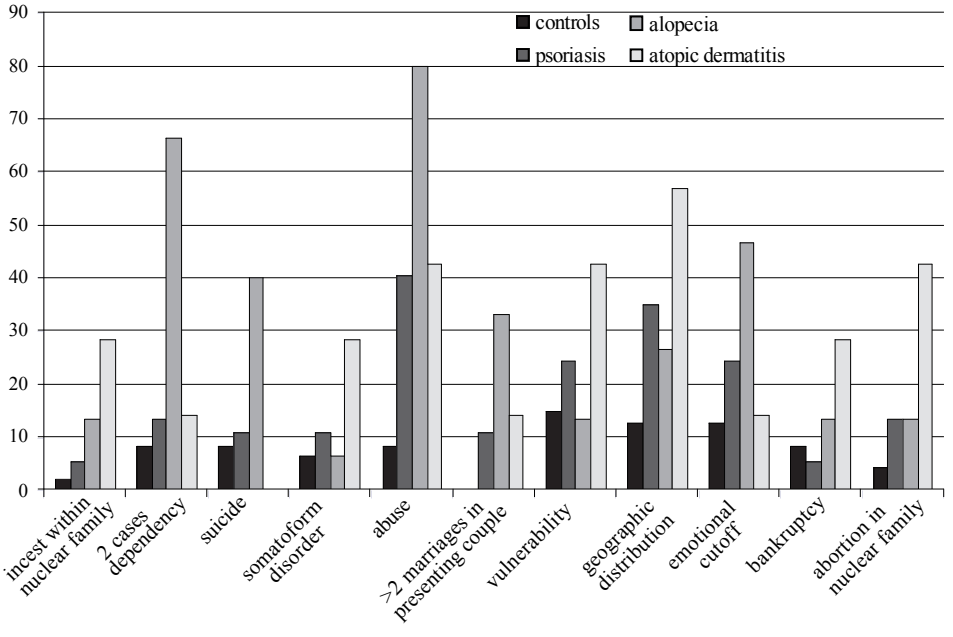

Fig. 2. Prevalence of positivity to some items of the genogram in cases and controls.

been found to be associated with psychological conditions (26), such as depression and anxiety (27) and stressful life events (8). Stress may also play a role in the onset and aggravation of alopecia areata (28). Finally, there is growing evidence indicating that both individual and family-related psychological factors, such as personality and stress, may play an important role in the pathogenesis of atopic dermatitis (10).

Information collected by the genogram is based on family therapy theories. For example, according to Bowen's systemic theory, the less the individuals are differentiated in the family the more they will manifest dysfunctional behaviour. According to Minuchin (29), there are four main features of dysfunctional families: enmeshment, rigidity, overprotectiveness and lack of conflict resolution. The genogram score takes into account all of these components, as well as traumatic events and physical aspects. Each item is scored 1 even if it is found in more than one person in the family, with the exception of incest and chemical dependency in the nuclear family (which are scored 2 points). This means that, even though there are questions concerning physical diseases, the genogram scale is not associated with the genetic transmission of diseases.

The genogram has some limits, since it is built by the patient with the caregiver step by step. Therefore, there could be some differences in the information provided by the patient, depending on the capability of the caregiver to draw out even delicate questions. However, to assess the reproducibility of the genogram score, we performed a pre-test, with two investigators, on the same patients ($n = 5$) in Brussels and we found no statistically significant difference between the scores. Due to the distance between the different centres, we could not assess the reproducibility of each investigator. However, in the two other centres, genograms were assessed by only one investigator in each centre.

Concerning the different centres, we observed that in Padova the difference between the genogram scores in cases and controls was not significant, probably due to the small sample size. However, it could also be due to the fact that in Padova the genogram interview was made by a resident in dermatology, while in the other centres the investigator was either a psychologist or a psychodermatologist, who is also a family therapist. This probably suggests, as already mentioned by the authors of the Genogram Scale, that this tool should be managed by trained psychologists or therapists.

The presence of family dysfunction in patients with dermatological conditions considered as strongly associated with the psychological component would be in line with the theory of familial trauma (30). According to this theory, wounded families try to repair the effects of trauma in becoming rigid and closed in on themselves. The psychosomatic symptoms would then be a manifestation of the conflict between an autonomic wish of the individual and the ties of loyalty to the cohesive and rigid functioning of the family. The high prevalence of anxiety and depression observed in patients with a high genogram score reflects the individual suffering in these families and confirms this interpretation.

The relationship between family dysfunction, disease and psychological factors is very complex. As one of the authors has already underlined in a previous publication (31), there is a need for a more complex vision of psychosomatics. It is thus not a question of determining whether anxiety, depression, or family dysfunctioning came first. The symptom appears at the crossing points of different elements, the biological, the individual and the relational ones. It is important to explore the family dysfunction, using instruments such as the genogram, in addition to the individual suffering, for which many instruments exist.

The use of the genogram may provide a lot of information. Rogers & Durkin (20) observed that physicians using a short semi-structured genogram interview recorded an average of four times more medical information about the family than when using the customary interview style of general family practice. Moreover, exploring the genogram can help to identify patients who are at risk of anxiety and depression and need psychological interventions (32). However, we are aware that the genogram is not an instrument that can be used in clinical practice and that collaboration with a specialist, such as a psychologist or a psychotherapist, is needed.

The individuation of family dysfunction should lead to family therapy for the patient. Indeed, if the psychosomatic symptom is a manifestation of a conflict of loyalty between individuation and the necessity of being part of a family stuck in dysfunctional behaviour to heal its past trauma, working on the autonomy of the individual alone would enhance the conflict.

A limitation of this study is that the data were not completely homogeneous in the different centres, both concerning the proportion of cases and controls, and the professional role of the people who collected the data. However, as it was shown, in performing a multivariate analysis, the association between family dysfunction and the presence of a dermatological condition was significant even after taking the different centres into account.

In conclusion, family dysfunction may play an important role in the onset or exacerbation of psoriasis, alopecia, and atopic dermatitis. If the dermatologist is not able to perform the genogram with the patient, he or she should be aware that patients with these dermatological conditions may need the help of a family therapist.

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Appendix I. *GENOGRAM SCALE*

Key:
C.D.= Chemical dependency (alcohol, drugs))
N.F. = Nuclear family
F.O. = Family of origin
P.C. = Presenting couple. This is a dyad in which one partner is the I.P. or accompanies a child I.P.
I.P. = Identified patient
F.M. = Family member
Genogram = The enrolled family members, the identified presenting couple, their children, siblings, nieces, nephews, parents, aunts, uncles, and grandparents.

SCORING SYSTEM outlined below is used, unless otherwise specified, if the item is found anywhere in the genogram or at any time during the interview.
+ 2 points for the following (1 point if found in extended family only)

1. Incest in N.F. ☐
2. Non recovering C.D. in N.F. ☐

+ 1 point for the following

3. F.M. displays emotional extremes in interview: flatness, anger, defensiveness, argumentative, hostile ☐
4. > 2 cases of C.D. in genogram ☐
5. Incest not in N.F ☐
6. Recent arrest or conviction in N.F ☐
7. Affair in P.C ☐
8. Chronic unemployment ☐
9. Repeated suicide attempts ☐
10. Member of N.F. with chronic or recurrent psychosis ☐
11. > 1 family member with a major somatiform disorder – hypochondriasis, conversion, panic anxiety state ☐
12. Recurrent or multiple family members with unplanned pregnancies ☐
13. Abuse (physicial and/or verbal), batter in N.F. and/or F.O ☐
14. Patient with illness with strong emotional overlay in N.F. – fibrositis, tension headaches, asthma, angina, etc. ☐
15. Adoption or uncertain paternity/maternity in N.F. ☐
16. > 2 marriages in 20 years in P.C. ☐
17. Pathological focus on children in N.F. (e.g., overidentification with child, overinvolvement or hypercritical) ☐
18. High illness vulnerability of member of N.F. (F.M. frequently seen in M.D.s office-misses school or work) ☐
19. Geographic distribution extremely widespread (> 2 states) or extremely close) ☐
20. Chronic and/or episodic debilitating illness in N.F. or F.O. (e.g., cystic fibrosis, rheumatoid arthritis, angina, asthma, Crohn' s disease) ☐
21. Deaths in N.F. or F.O. prior to age 60 ☐
22. Less than grade 12 at completion of education ☐
23. Emotional cutoff from F.O., siblings, children or spouse. ☐
24. Bankruptcy or job termination in P.C ☐
25. Elective abortion in nuclear family ☐
26. Divorce of nuclear family member ☐
27. Remarriage of family member ☐
28. Incarceration of family member ☐
29. Immigration – 1st generation in P.C. ☐